

CLAIMS

1. A foreign matter detecting and eliminating system comprising:

a tubular distribution head having one closed end and one open end connected to a feed line for carrying a fluid and provided with a plurality of axially arranged oblong slits;

a plurality of main passages having a flat sectional shape and communicating with the interior of the distribution head by means of the oblong slits;

an optical foreign matter detecting means combined with the main passages to detect foreign matters included in the fluid flowing through the main passages; and

foreign matter eliminating devices disposed below the foreign matter detecting means with respect to the flowing direction of the fluid and capable operating in response to a foreign matter detection signal provided by the foreign matter detecting means to discharge a predetermined quantity of the fluid containing foreign matters.

2. The foreign matter detecting and eliminating system according to claim 1, wherein the width of the oblong slits of the distribution head is determined on the basis of a required fluid processing rate at which the fluid is to be processed and presumed sizes of foreign matters and is equal to or less than the thickness of a section of the main passages.

3. The foreign matter detecting and eliminating system according to claim 1, wherein the foreign matter detecting means include:

an illuminating means disposed so as to face inspection parts each formed by covering openings formed in side walls defining the main passage so as to open into the main passage with transparent members to emit light toward the inspection parts, and

a CCD sensor for receiving light emitted by the light emitting means and transmitted by the fluid flowing through the main passages to detect foreign matters;

wherein foreign matters are detected by comparing the

moving average of an analog signal provided by the CCD sensor and a signal provided in each scanning cycle and calculating the difference between the moving average and the signal provided in each scanning cycle.

4. The foreign matter detecting and eliminating system according to claim 1, wherein foreign matter eliminating passages are formed parallel to the main passages below the foreign matter detecting means, the foreign matter eliminating passages are formed in a sectional area equal to that of the main passages, a reject valve is placed at an upper end, with respect to the flowing direction of the fluid, of each foreign matter eliminating passage to connect the main passage to and disconnecting the same from the foreign matter eliminating passage, and the sum of the respective effective sectional areas of the main passage and the associated foreign matter eliminating passage is constant even in a state where the reject valve is in a passage changing operation.

5. The foreign matter detecting and eliminating system according to claim 4, wherein each of the reject valves has a valve element slidably fitted in a cylindrical valve hole perpendicular to the main passage, and a driving unit for operating the valve element; and the valve element is provided with a skew through hole for connecting the main passage and the foreign matter eliminating passage when the reject valve is driven for a passage changing operation.

6. The foreign matter detecting and eliminating system according to claim 4 further comprising a means for measuring flow rate at which the fluid flows into the distribution head and calculating flow velocity at which the fluid flows;

wherein working time of the reject valve is controlled according to the flow velocity of the fluid.